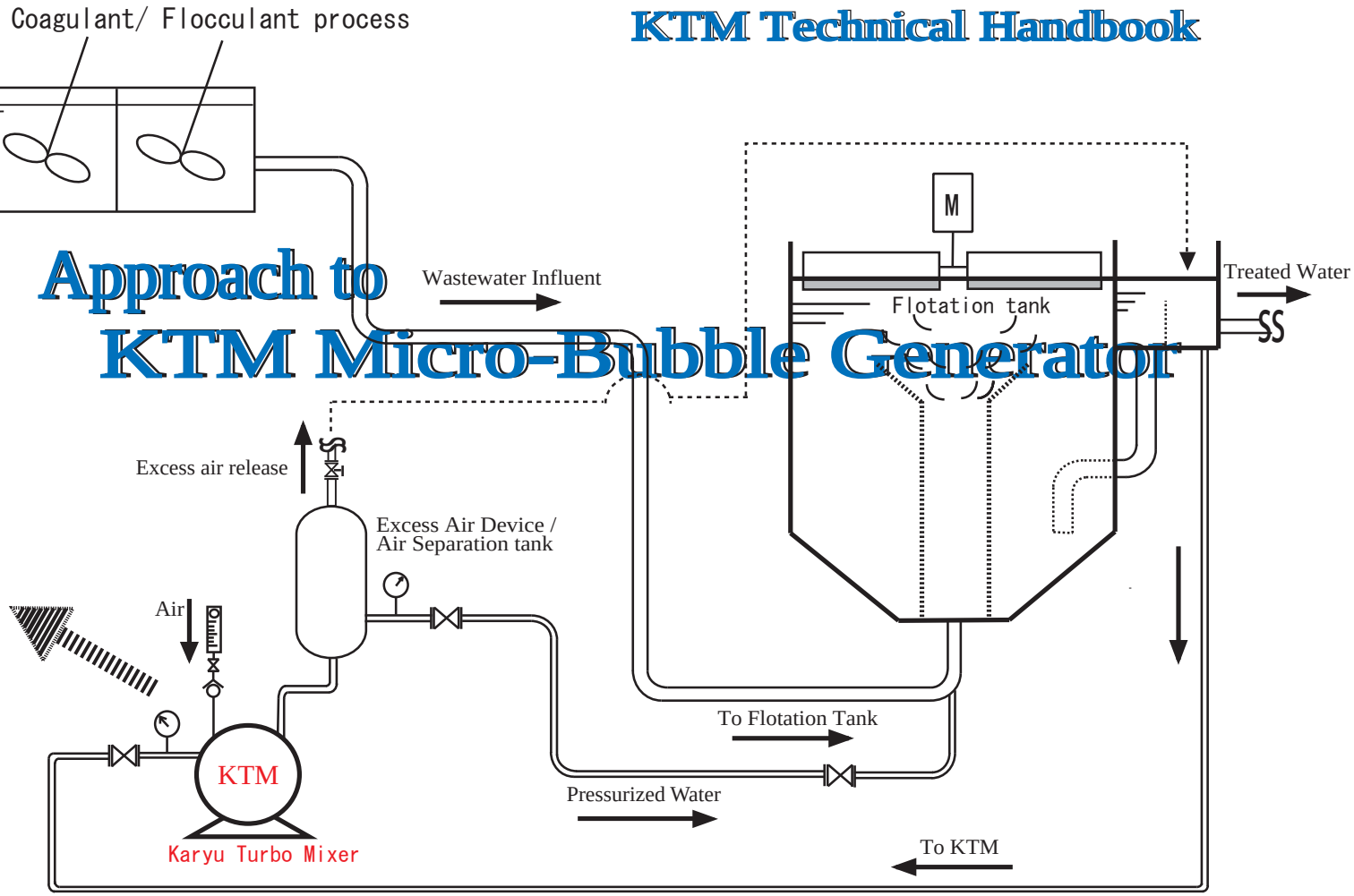
KTM Technical Handbook

Approach to KTM Micro-Bubble Generator



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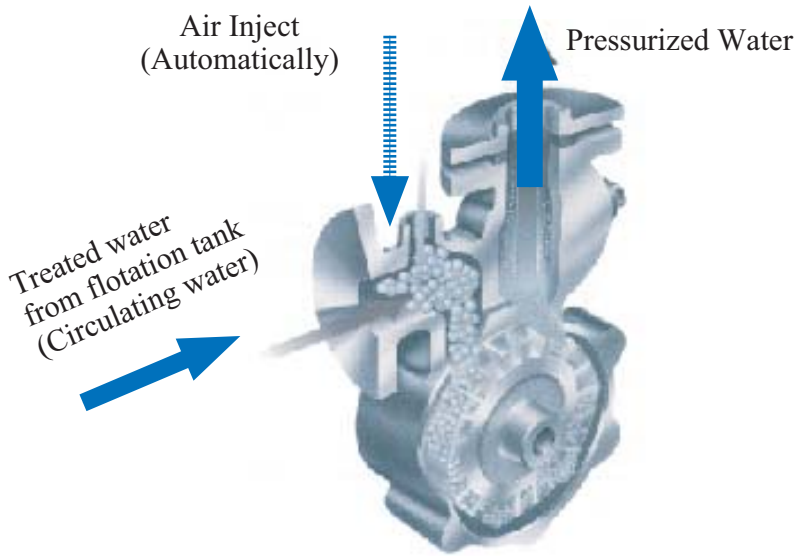
Introduction

NIKUNI has supplied a unique compact micro-bubble generator, called KTM, contributing to remove contaminant particles with a small amount of chemical aid in the water purifying plant.



Suction - Mixing - Tranfering by KTM

KTM has a highly precise and sophisticated pumping mechanism that can generate plenty of micro-bubbles by three hydro-dynamic principles:Negative pressure sucking both air and water simultaneously from each port; air effectively mixed into water; finally properly producing pressurized air-enriched discharge

The pressurized air-enriched water is transferred into the bottom of the dissolved air flotation tank. Then it makes a bubble sparkling formation spreading and growing up to the water surface and finally form a sludge mat.
It will be skimmed off.

- Features of KTM -

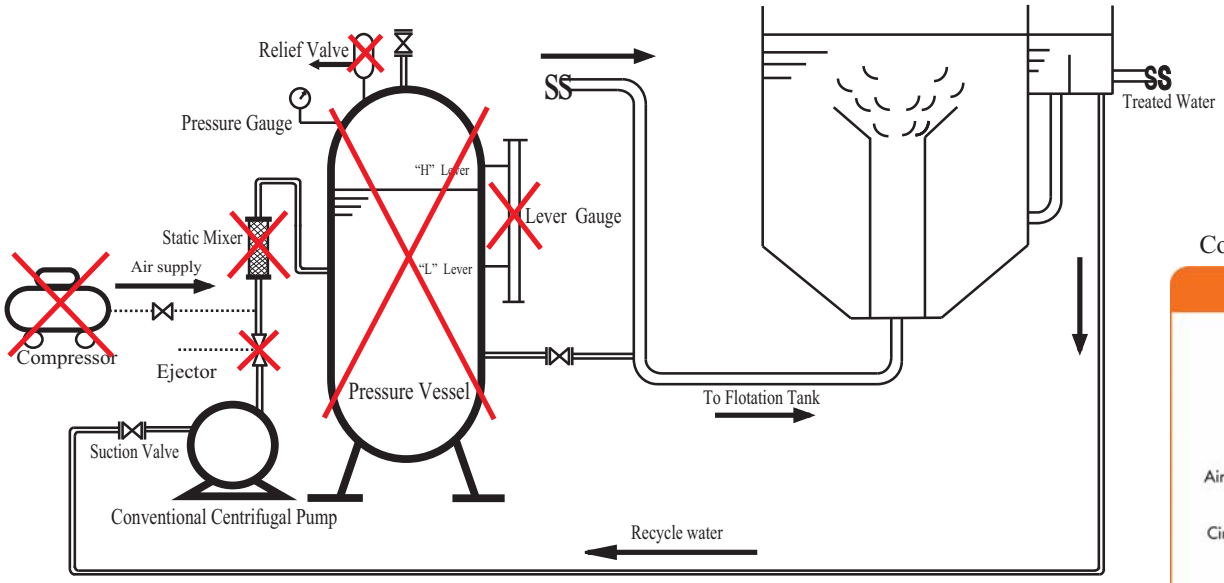
- ●High contaminant removal efficiency
  --- supplying a highly dense micro-bubble formation
- ●Continuously steady dissolved air flotation
  ---fine adjustment not necessary during operation
- ●Applicable for additional installation
  --- narrow space installation
- ●Minimum power consumption
  --- power required for KTM only
- ●Easy maintenance and minimum operation cost
  --- compact and simple in structure
- ●Quiet in operation
  --- no compressor, controls, dissolve tank are required

Any gas of air, oxygen, ozone, etc. available for your purpose

- Application and Industries served of DAF -

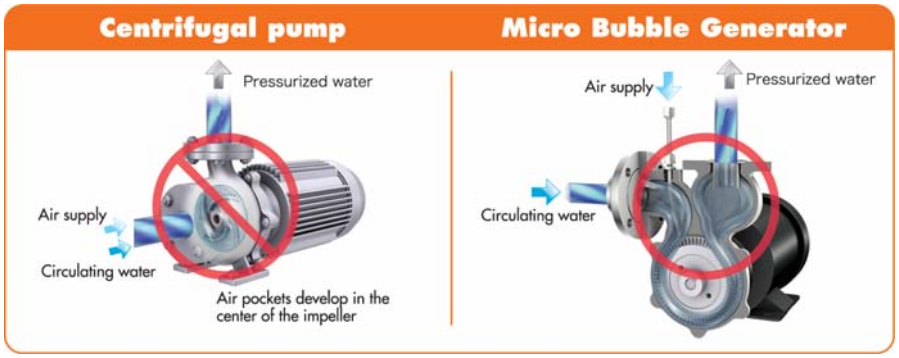
- ●Water clarifications for Dairies, Breweries, Fish / Meat / / Live Stock Processing / Laundries / Pharmaceuticals / / Membrane System Pre-treatment / Textile Effluent / / Bakeries / Snack food Production.
- ●Fiber Recovery in Pulp and Paper Mills.
- ●Oil and Water Separation – Oil Recovery.
- ●Industrial mfg.
  --- Removing mold release agent power-press lubricant.
- ●Semiconductor mfg.
  ---Removing metallic compounds foreign matter.
- ●Algae Biofuels / Algae Removal.
- ●Municipalities
  ---Primary / Secondary Clarification for Drinking Water
- ●Vehicle Washers Effluent Treatment & Recycling.

Advantages of NIKUNI KTM compared to conventional Pressure Tank Method



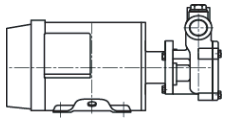
* Remarks : X mark equipments are not required for NIKUNI KARYU TURBO MIXER (KTM)

Comparision in typical characteristic of KTM with centrifugal pump

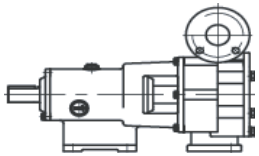


	NIKUNI KARYU TURBO MIXER (KTM) METHOD	CONVENTIONAL PRESSURED TANK METHOD
Structure	* Sucking Air, Mixing, Pressurizing/ Transfering can be done by KTM itself.	* Compressor, Static Mixier, Ejector, Big Pressured Dissolution Tank. * 3 to 5 minutes is necessary for dissolution in the saturation tank.
Air Dissolution Method	* Air dissolves into water inside of KTM due to it's high mixing & Pressurizing characteristic.	* Air dissolves at tank spending for 3-5 minutes .
Operation & Maintenance	* Almost can be run with maintenance free operation when after initial setting. * Small fine bubbles can be supplied soon after turning power on.	* Complicated and difficult adjustment for air and water pressure when turning ON / OFF of the system.
Foot Print	* Small foot print with compact structure.	* Big foot print due to many components are required.
Noise	* Low Noise with sucking air automatically from atmosphere by KTM.	* Lound operation noise because of sucking air from compressor.
Operation Cost	* Economical due to Motor Power electricity consumption only.	* No economical because of Motor & Compressor electricity consumption.

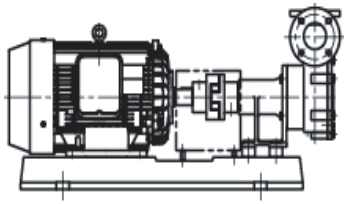
Contents



Closed-Couple type



Bare Pump



Coupling Type
(Normally motor will not be supplied by NIKUNI)

- KTM Selection Guide -

KTM models, available for the selection responding to various intension on the plant design stage, are roughly classified into three types; close-coupled type, bare pump and coupling type. Material of the wetted part can be selected in Cast iron or SS304 for each model. In addition, an assembly of check valve and air inject nozzle assembly is packed in KTM package of each model.

1. Close-coupled Type / Monoblock Type
   A series of the most compact and complete set of the micro-bubble generator has been put in our arrangement, but without pump base. This model arrangement is restricted within a narrow range of KTM15 to KTM40.

2. Bare Pump
   Individual KTM core, and basically original of Coupling Type. Pump base or channel base is basically not attached.

3. Coupling Type
   The coupling attached KTM models are most popularly in t market. Nikuni will supply bare pump, pump base (base plate) and coupling set with coupling guard only.
   Depending on your plant site environmental situation, the driven motor protection system can be applied.

4. Nozzle Assembly
   A nozzle and check valve assembled attached to every model, specified in correspondent to each model.

Techinical Comments on KTM and Relative Factors

Note (Important) :
Suction & Discharge Valves, Compound & Pressure Gauges must be installed for initially fine adjustment

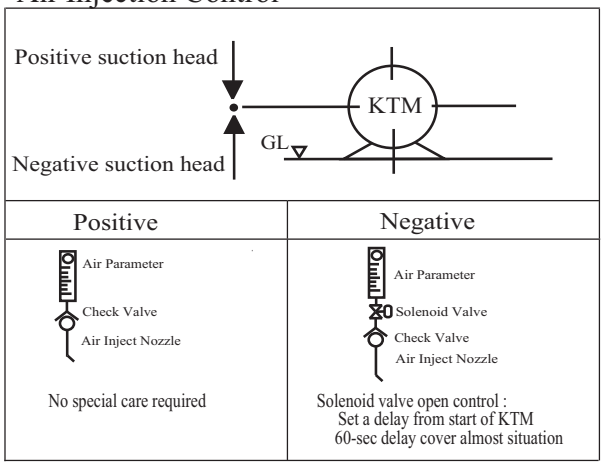
1. Inching test
   - Rotation smoothness & rotation direction is correct.
2. Piping
   - Those necessary valves, gauges have been installed, non-cavitation piping and suction head position.

3 Turn power OFF :
- Prime water into KTM
- Knob of the air parameter is shutted or close the air inject valve.
- Suction & discharge valves are completely OPEN

4. Turn power ON :
- Setting the discharge pressure into the range from 0.3MPa to 0.4Mpa (3 bar to 4 bar)
- Setting the suction pressure into minus range from −0.02MPa to −0.03MPa. (approx. −0.2 bar to −0.3 Bar)
- Open the knob of Airflow meter or valve as to drawn-in air automatically. (refer to page 9 for air volume adjustment)

5. Please refer to page 11 for "Excess Air Device / Separation Tank" detail.

Air Injection Control



Micro-bubbles Keeping Control

KTM - Flotation Tank [SHORT]

GATE & THROTTLE

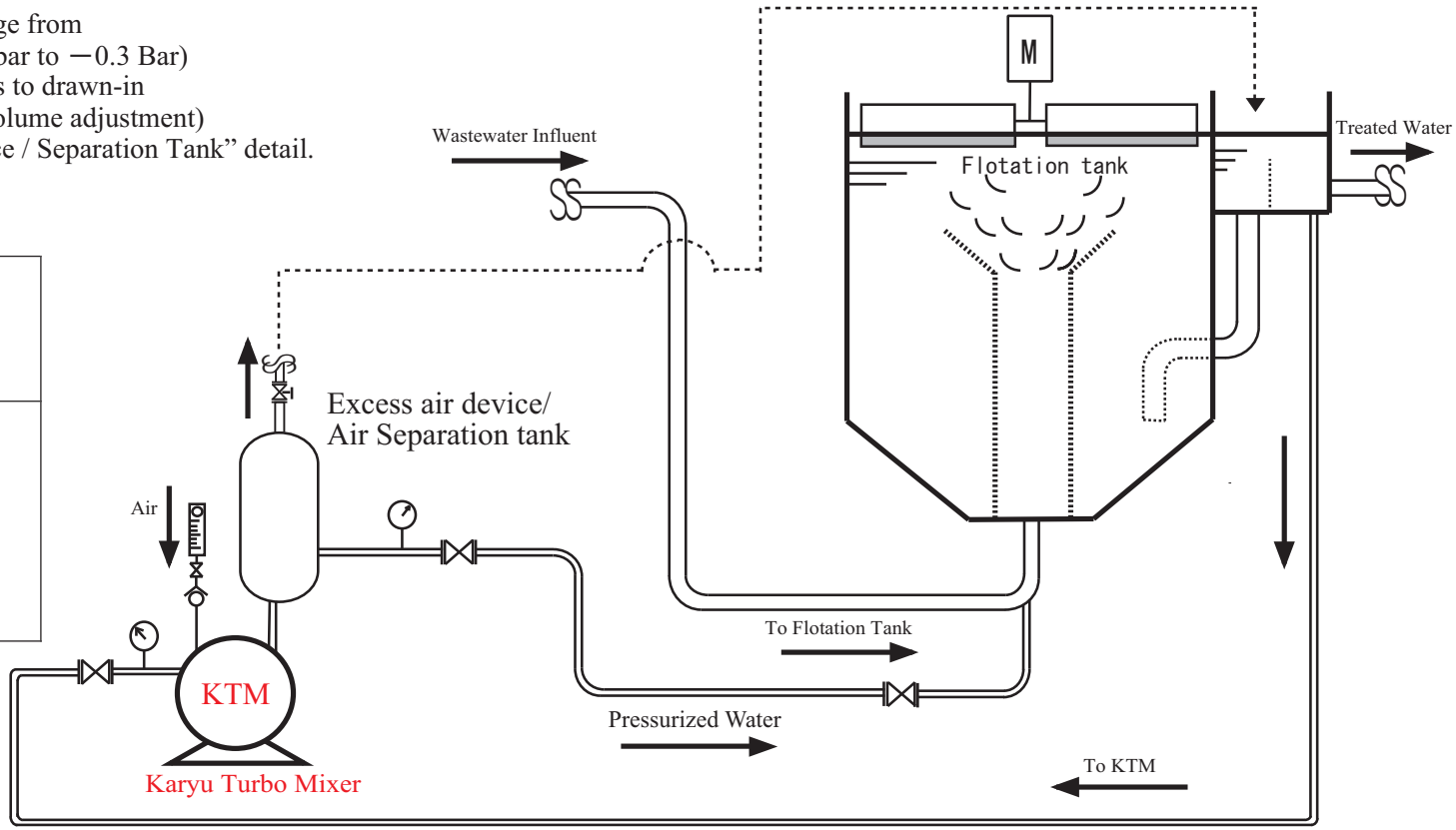
No Special consideration required

KTM - Flotation Tank [LONG / More than 2m]

GATE — THROTTLE

Fully open when operation

Gate and Throttle valves put in this order to prevent that bubbles attach to the inside wall of piping and they will grow up to lagre one. GATE is used for maintenance.



KTM Performace Tables

Discharge Pressure : 0.4 MPa = 4kg / cm2 = 4 bar = 56 PSI Air / Water discharge Amount Ratio : 8%

Typical Basic Data for KTM 50Hz Models

Closed-couple / Monoblock Type

Model	Wetted Part Material	Output (kW)	Water Flow Rate			Air Flow Rate			Current (A)
			L/min	m3/h	GPM	NL/min	Nm3/h	NGPM	200V
KTM20FD04(S)ZM	Cast Iron / SS	0.56	16.6	1.00	4.4	1.3	0.08	0.4	2.43
KTM20ND04(S)ZM	SS304								
KTM25FD07P	Cast Iron / SS	0.975	25	1.50	6.6	2.0	0.12	0.5	3.84
KTM25ND07P	SS304								
KTM32FD15P	Cast Iron / SS	1.95	50	3.00	13.2	4.0	0.24	1.1	7.57
KTM32ND15P	SS304								
KTM40FD22P	Cast Iron / SS	2.42	80	4.80	21.1	6.4	0.38	1.7	9.26
KTM40ND22P	SS304								

Coupling Type (Medium Flow Rate)

Model	Wetted Parts Material	Water Flow Rate			Air Flow Rate			Required Motor Power
		L/min	m3/h	GPM	NL/min	Nm3/h	NGPM	kW (HP)
KTM20F	Cast Iron / SS	16.6	1.00	4.4	1.3	0.08	0.4	0.75kW (1HP), 2-Pole
KTM20N	SS304							
KTM25F	Cast Iron / SS	25	1.50	6.6	2.0	0.12	0.5	1.5kW (2HP), 2-Pole
KTM25N	SS304							
KTM32F	Cast Iron / SS	50	3.00	13.2	4.0	0.24	1.1	2.2kW (3HP), 2-Pole
KTM32N	SS304							
KTM40F	Cast Iron / SS	80	4.80	21.1	6.4	0.38	1.7	3.7kW (5HP), 2-Pole
KTM40N	SS304							

Coupling Type (Large Flow Rate)

Model	Wetted Parts Material	Water Flow Rate			Air Flow Rate			Required Motor Power
		L/min	m3/h	GPM	NL/min	Nm3/h	NGPM	kW (HP)
KTM50F1	Cast Iron / SS	133	8.0	35	11	0.64	3	5.5kW (7HP), 4-Pole
KTM50S1	SS304							
KTM50F2	Cast Iron / SS	200	12.0	53	16	0.96	4	7.5kW (10HP), 4-Pole
KTM50S2	SS304							
KTM50F3	Cast Iron / SS	250	15.0	66	20	1.20	5	11kW (15HP), 4-Pole
KTM50S3	SS304							
KTM65F2	Cast Iron / SS	333	20.0	88	27	1.60	7	15kW (20HP), 4-Pole
KTM65S2	SS304							
KTM80F	Cast Iron / SS	700	42.0	184	56	3.36	15	22kW (30HP), 4-Pole
KTM80S	SS304							

Typical Basic Data for KTM 60Hz Models

Closed-couple / Monoblock Type

Model	Wetted Parts Material	Motor Output (kW)	Water Flow Rate			Air Flow Rate			Current (A)	
			L/min	m3/h	GPM	NL/min	Nm3/h	NGPM	200V	220V
KTM20FD07P	Cast Iron / SS	0.975	21.7	1.30	5.7	1.7	0.10	0.5	3.7	3.43
KTM20ND07P	SS304									
KTM25FD15P	Cast Iron / SS	1.95	41.7	2.50	11.0	3.3	0.20	0.9	7.56	6.8
KTM25ND15P	SS304									
KTM32FD15P	Cast Iron / SS	1.95	66.7	4.00	17.5	5.3	0.32	1.4	9.13	8.23
KTM32ND15P	SS304									
KTM40FD22P	Cast Iron / SS	2.42	116.7	7.00	30.7	9.3	0.56	2.5	13.2	12.2
KTM40ND22P	SS304									

Coupling Type (Medium Flow Rate)

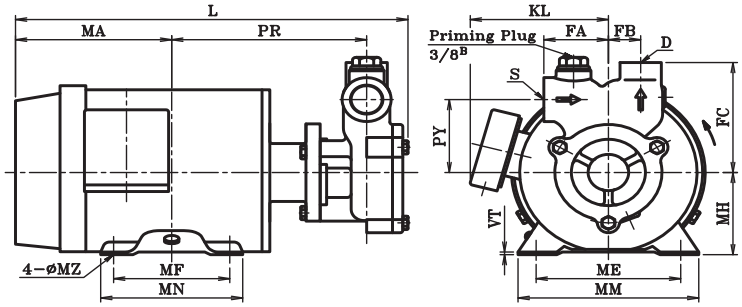
Model	Wetted Part Material	Water Flow Rate			Air Flow Rate			Required Motor Power
		L/min	m3/h	GPM	NL/min	Nm3/h	NGPM	kW (HP)
KTM20F	Cast Iron / SS	22	1.30	5.7	1.7	0.10	0.5	0.75kW (1HP), 2-Pole
KTM20N	SS304							
KTM25F	Cast Iron / SS	42	2.50	11.0	3.3	0.20	0.9	1.5kW (2HP), 2-Pole
KTM25N	SS304							
KTM32F	Cast Iron / SS	67	4.00	17.5	5.3	0.32	1.4	2.2kW (3HP), 2-Pole
KTM32N	SS304							
KTM40F	Cast Iron / SS	117	7.00	30.7	9.3	0.56	2.5	3.7kW (5HP), 2-Pole
KTM40N	SS304							

Coupling Type (Large Flow Rate)

Model	Wetted Part Material	Water Flow Rate			Air Flow Rate			Required Motor Power
		L/min	m3/h	GPM	NL/min	Nm3/h	NGPM	kW (HP)
KTM50F1	Cast Iron / SS	192	11.5	50	15	0.92	4	7.5kW (10HP), 4-Pole
KTM50S1	SS304							
KTM50F2	Cast Iron / SS	250	15.0	66	20	1.20	5	11kW (15HP), 4-Pole
KTM50S2	SS304							
KTM50F3	Cast Iron / SS	300	18.0	79	24	1.44	6	15kW (20HP), 4-Pole
KTM50S3	SS304							
KTM65F2	Cast Iron / SS	467	28.0	123	37	2.24	10	18.5kW (25HP), 4-Pole
KTM65S2	SS304							
KTM80F	Cast Iron / SS	967	58.0	254	77	4.64	20	30kW (40HP), 4-Pole
KTM80S	SS304							

KTM Outline Measurement Table

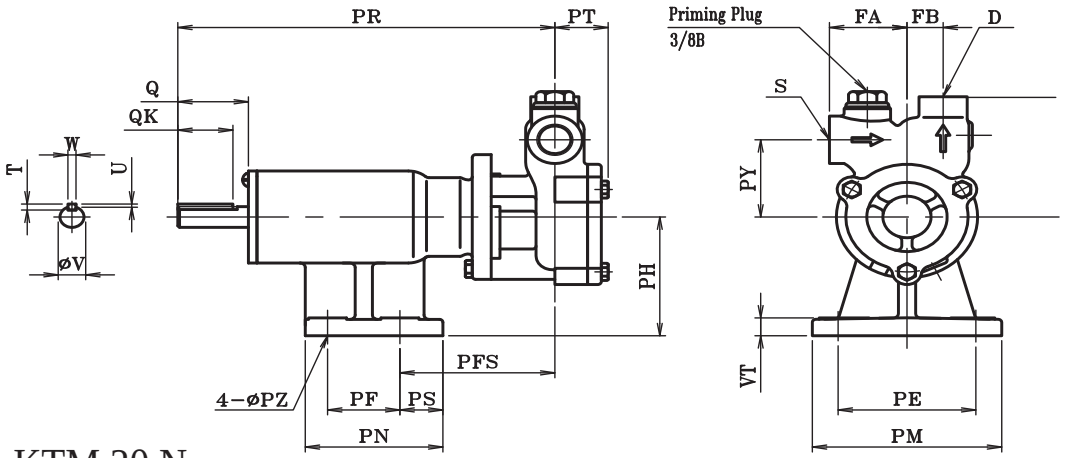
Closed-couple / Monoblock Type
Model : KTM_ND / KTM_FD



KTM 20 F D 07 P

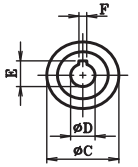
- Model Name
- Suction Port Diameter: 15 20 25 32 40 mm
- Wetted Part Material: F:Cast Iron/SS N:SS304
- Closed-coupled Type
- Motor Output: 04:0.56kW 07:0.975kW 15:1.97kW 22:2.42kW
- Motor Type (P :IE3 Premium motor) Total-Enclosed Fan-Cooled Type

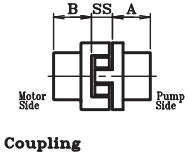
Coupling Type (Medium Flow Rate
Model : KTM_N / KTM_F



KTM 20 N

- Model Name
- Suction Port Diameter: 15 20 25 32 40 mm
- Wetted Part Material: F:Cast Iron/SS N:SS304





Coupling

Coupling Dimension

kW	A	B	C	D	E	F	SS
0.4	22	22	51	14	16.3	5	14
0.75	22	36	51	19	21.8	5	14
.5, 2.2	36	36	71	24	27.3	6	16
3.7	36	36	71	28	31.3	8	16

Dimension & weight — Unit:mm,kg (Net weight)

Model		kW	S	D	PR	PY	FA	FB	FC	MH	L	MA	ME	MF	MM	MN	MZ	VT	KL	Weight
TEFC*1	KTM15ND02P	0.31	Rc1/2	Rc3/8	152	52	45	21	81	71	304	121	112	90	140	110	7×8	2.3	107	13
	KTM20ND04P	0.56	Rc3/4	Rc1/2	151	63	50	25	95	71	304	121	112	90	140	110	7×8	2.3	107	18
	KTM20ND07P	0.975	Rc3/4	Rc1/2	144.5	63	50	25	95	80	324.5	148	125	100	165	130	10×8	4.5	146	24
	KTM25ND07P	0.975	Rc1	Rc3/4	144.5	70	60	28	105	80	331	148	125	100	165	130	10×8	4.5	146	24
	KTM25ND15P	1.95	Rc1	Rc3/4	167.5	70	60	28	105	90	360.5	154.5	140	125	176	149	10×12	10	156	25
	KTM32ND15P	1.95	Rc1 1/4	Rc1	167.5	80	65	35	120	90	366	154.5	140	125	176	149	10×12	10	156	26
	KTM40ND22P	2.42	Rc1 1/2	Rc1 1/4	171.5	85	70	40	130	90	405	183.5	140	125	176	149	10×12	10	156	28
SPM*2	KTM15ND02S	0.3	Rc1/2	Rc3/8	152	52	45	21	81	71	281	98	112	90	150	110	7×20	3.2	86	13
	KTM20ND04S	0.56	Rc3/4	Rc1/2	164.5	63	50	25	95	80	311.5	115	125	100	167	125	10×17	3.2	91	18

Note : Dimension is for SS304 Model.
For Cast Iron / SS, dimension is almost similar to the above. Please ask for detail.

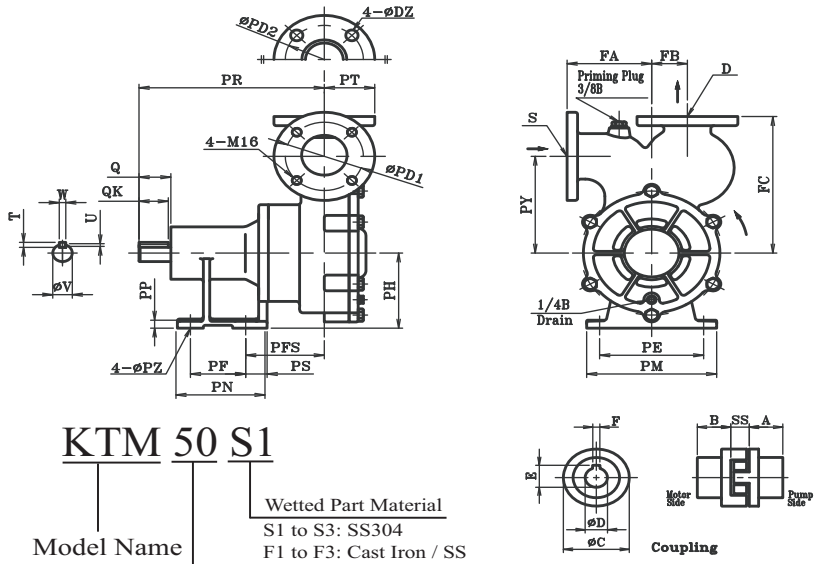
Dimension & weight — Unit:mm,kg (Net weight)

Model	S	D	PR	PY	FA	FB	PFS	FC	PH	PT	PE	PF	PM	PN	PS	VT	Q	QK	T	U	V	W	Weight
KTM15N	Rc1/2	Rc3/8	219	52	45	21	90	81	80	31	80	42	110	80	25	12	41	32	5	2	14	5	15
KTM20N	Rc3/4	Rc1/2	218	63	50	25	89	95	80	32	80	42	110	80	25	12	41	32	5	2	14	5	18
KTM25N	Rc1	Rc3/4	224	70	60	28	95	105	80	38.5	80	42	110	80	25	12	41	36	6	2.5	19	6	20
KTM32N	Rc1 1/4	Rc1	224	80	65	35	95	120	80	44	80	42	110	80	25	12	41	36	6	2.5	19	6	25
KTM40N	Rc1 1/2	Rc1 1/4	238	85	70	40	74	130	90	50	100	58	130	85	11	12	49	45	7	3	24	8	30

Note : Dimension is for SS304 Model.
For Cast Iron / SS, dimension is almost similar to the above. Please ask for detail.

KTM Outline Measurement

Coupling Type with Motor Dimension
Model : KTM_N / KTM_F (Medium Flow Rate)



KTM 50 S1

Model Name

Wetted Part Material
S1 to S3: SS304
F1 to F3: Cast Iron / SS

Suction Port Diameter
50 65 80 mm

Coupling dimension

kW	A	B	C	D	E	F	SS
5.5, 7.5	45	45	90	38	41.3	10	24
11, 15	55	55	120	42	45.3	12	40

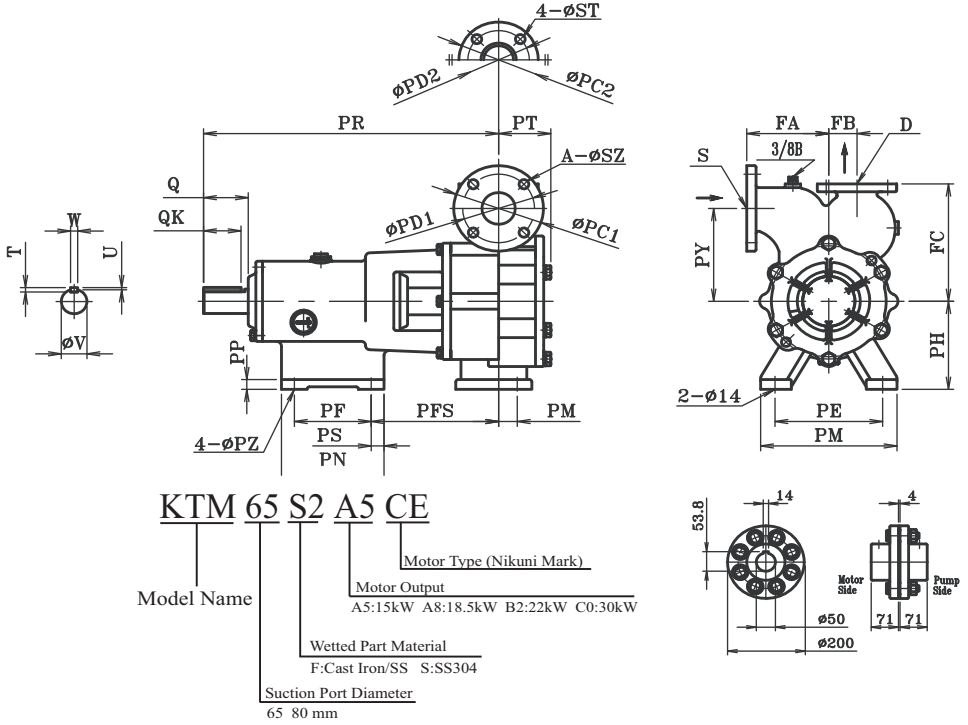
Dimension & weight Unit:mm,kg (Net weight)

型 式	S	D	PR	PY	FA	FB	FC	PE	PM	PT	PD1	PD2	PH
KTM50S1	50A	50A	285	160	130	55	230	160	200	77.5	120	120	132
KTM50S2	50A	50A	285	170	130	55	240	160	200	77.5	120	120	132
KTM50S3	50A	50A	285	170	130	55	240	160	200	77.5	120	120	132

	PFS	PS	PF	PN	PP	PZ	Q	QK	T	U	V	W	Weight
KTM50S1	121	33	85	138	14	14	49	45	7	3	30	8	90
KTM50S2	121	33	85	138	14	14	49	45	7	3	30	8	110
KTM50S3	121	33	85	138	14	14	49	45	7	3	30	8	125

Note : Dimension is for SS304 Model. For Cast Iron / SS, dimension is almost similar to the above. Please ask for detail.

Coupling Type with Motor Dimension
Model : KTM_S / KTM_F (Large Flow Rate)



KTM 65 S2 A5 CE

Model Name

Motor Type (Nikuni Mark)

Motor Output
A5:15kW A8:18.5kW B2:22kW C0:30kW

Wetted Part Material
F:Cast Iron/SS S:SS304

Suction Port Diameter
65 80 mm

Dimension & weight Unit:mm,kg (Net weight)

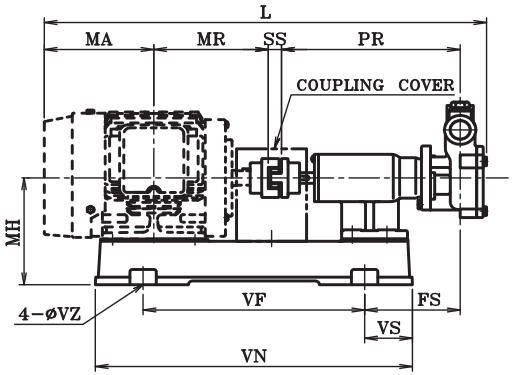
Model	S	D	PR	PY	FA	FB	FC	PH	PE	PM	PT	PD1	PD2	PC1	PC2	PM	PFS
KTM65S2	65A	50A	575.5	190	160	55	240	180	210	266	102	140	120	175	155	36.5	248.5
KTM80S	80A	65A	582	180	170	80	280	180	270	326	127	150	140	185	175	45	255

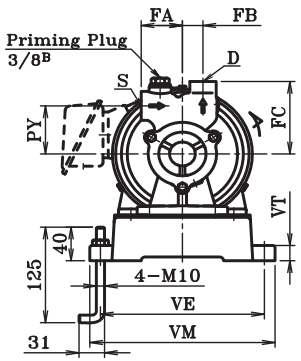
Model	PS	PF	PN	PP	PZ	SZ	ST	TS	TZ	Q	QK	T	U	V	W	Weight
KTM65S2	25	150	200	20	14	19	19	230	280	87	74	9	3.5	50	14	250
KTM80S	25	150	200	20	19	19	19	230	280	87	74	9	3.5	50	14	300

Note : Dimension is for SS304 Model. For Cast Iron / SS, dimension is almost similar to the above. Please ask for detail.

KTM Outline Measurement

Coupling Type with Motor Dimension
Model : KTM_N / KTM_F (Medium Flow Rate)





KTM 20 N 07 CE

- Model Name
- Suction Port Diameter: 15 20 25 32 40 mm
- Wetted Part Material: F:Cast Iron/SS N:SS304
- Motor Output: 07:0.75kW 15:1.5kW 22:2.2kW 37:3.7kW
- Motor Type (Nikuni Mark)

KTM 50 S1 55 CE

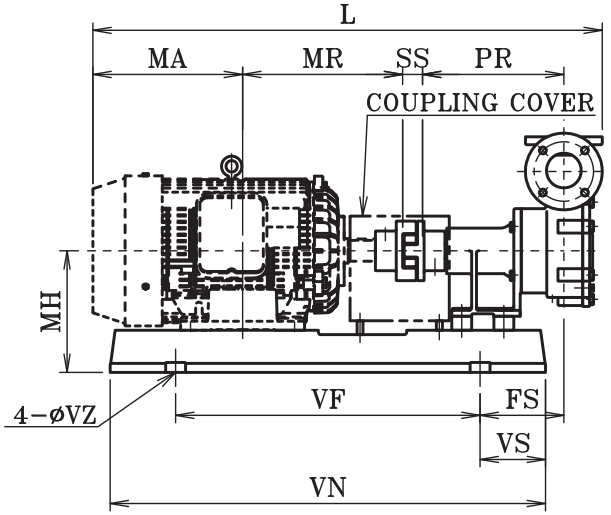
- Model Name
- Suction Port Diameter: 50 65 80 mm
- Wetted Part Material: F:Cast Iron/SS S:SS304
- Motor Output: 55:5.5kW 75:7.5kW A1:11kW A5:15kW A8:18.5kW B2:22kW C0:30kW
- Motor Type (Nikuni Mark)

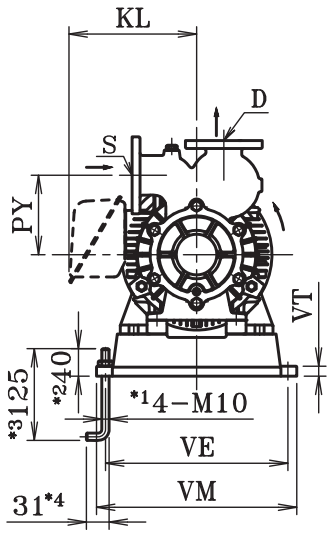
Dimension & weight — Unit:mm,kg (Net weight)

Model	S	D	PR	PY	FA	FB	PFS	FC	PH	PT	PE	PF	PM	PN	PS	VT	Q	QK	T	U	V	W	Weight
KTM15N	Rc1/2	Rc3/8	219	52	45	21	90	81	80	31	80	42	110	80	25	12	41	32	5	2	14	5	15
KTM20N	Rc3/4	Rc1/2	218	63	50	25	89	95	80	32	80	42	110	80	25	12	41	32	5	2	14	5	17
KTM25N	Rc1	Rc3/4	224	70	60	28	95	105	80	38.5	80	42	110	80	25	12	41	36	6	2.5	19	6	20
KTM32N	Rc1 1/4	Rc1	224	80	65	35	95	120	80	44	80	42	110	80	25	12	41	36	6	2.5	19	6	21
KTM40N	Rc1 1/2	Rc1 1/4	238	85	70	40	74	130	90	50	100	58	130	85	11	12	49	45	7	3	24	8	30

Note : Dimension is for SS304 Model.
For Cast Iron / SS, dimension is almost similar to the above. Please ask for detail.

Coupling Type with Motor Dimension
Model : KTM_S / KTM_F (Large Flow Rate)





Dimension & weight — Unit:mm,kg (Net weight)

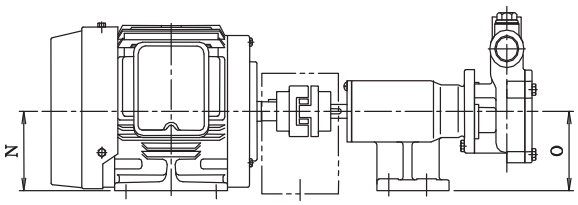
Model	kW	S	D	PR	PY	FA	FB	FS	FC	MH	L	MA
KTM50S1	5.5	50A	50A	285	160	130	55	150	230	204	836	210.5
	7.5	50A	50A	285	160	130	55	160	230	204	874	229.5
KTM50S2	7.5	50A	50A	285	170	130	55	160	240	204	874	229.5
KTM50S3	11	50A	50A	285	170	130	55	169	240	245	1027.5	302
	15	50A	50A	285	170	130	55	169	240	245	1027.5	280
KTM65S2	15	65A	50A	575.5	190	160	55	102.5	240	300	1276.5	250
	18.5	65A	50A	575.5	190	160	55	102.5	240	300	1353	291.5
KTM80S	22	80A	65A	582	180	170	80	109	280	300	1356	291.5
	30	80A	65A	582	180	170	80	39.5	280	360	1429	345.5

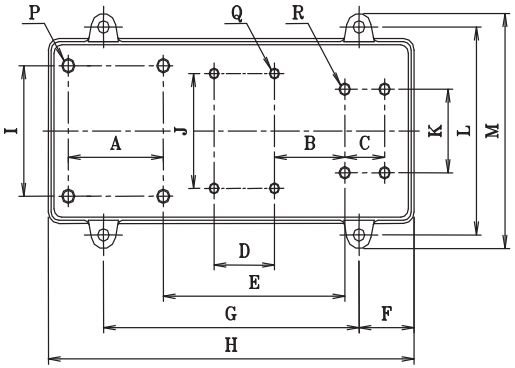
	MR	SS	VE	VF	VM	VN	VS	VT	VZ	KL	Weight
KTM50S1	239	24	324	448	352	690	121	20	12	189	90
	258	24	324	448	352	690	121	20	12	189	90
KTM50S2	258	24	324	448	352	690	121	20	12	189	110
KTM50S3	323	40	368	614	404	878	132	20	15	257.5	120
	345	40	368	614	404	878	132	20	15	257.5	130
KTM65S2	345	4	462	835	512	1285	225	30	19	256	240
	351.5	4	462	835	512	1285	225	30	19	335	250
KTM80S	351.5	4	462	835	512	1285	225	30	19	279	300
	370.5	4	356	950	430	1250	150	17.5	19	314	300

Note : Dimension is for SS304 Model. For Cast Iron / SS, dimension is almost similar to the above. Please ask for detail.

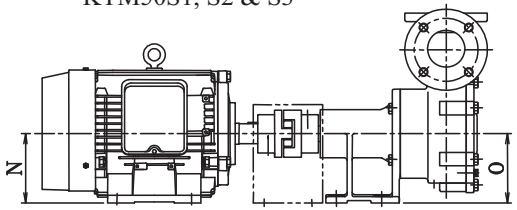
Base Plate Dimensions

KTM_N SERIES

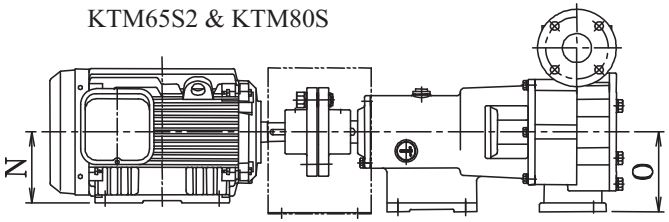


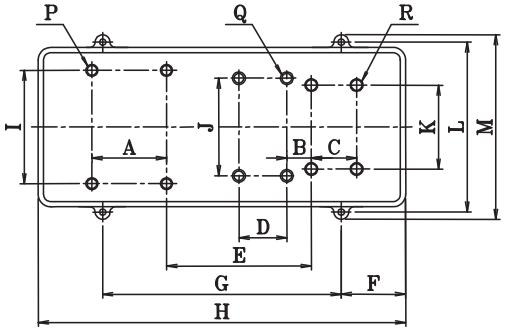


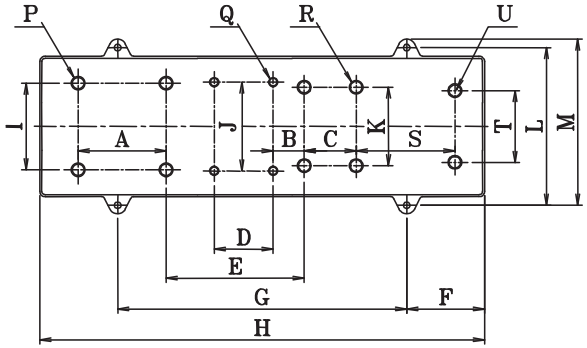
KTM50S1, S2 & S3



KTM65S2 & KTM80S





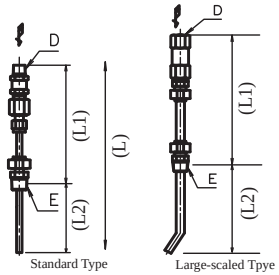


Model	kW	A	B	C	D	E	F	G	H	I
KTM20N	0.75	100	97	42	-	191	58	269	385	125
KTM25N	1.5	125	90	42	-	211	65	300	430	140
KTM32N	2.2									
KTM40N	3.7	140	70	58	90	254	96	425	616	190
Model	**kW**	**J**	**K**	**L**	**M**	**N**	**80**	**P**	**Q**	**R**
KTM20N	0.75	90	80	199	225	80	80	4-M8	2-M6	4-M10
KTM25N	1.5	120	80	214	240	90	80	4-M8	2-M8	4-M10
KTM32N	2.2									
KTM40N	3.7	130	100	280	310	112	90	4-M10	4-M8	4-M10

Model	kW	A	B	C	D	E	F	G	H	I	J	K
KTM50S1	5.5	140	48	85	90	272	121	448	690	216	178	160
	7.5	178	48	85	90	272	121	448	690	216	178	160
KTM50S2 KTM50S3	7.5	178	48	85	90	272	121	448	690	216	178	160
	11	210	45	85	160	337	132	614	878	254	190	160
	15	254	45	85	160	337	132	614	878	254	190	160
KTM65S2	15	254	90	150	170	399	225	835	1285	254	260	230
	18.5	241	90	150	170	412	225	835	1285	279	260	230
KTM80S	22	241	90	150	170	412	225	835	1285	279	260	230
	30	279	94.5	150	170	412	150	950	1250	279	260	230
Model	**kW**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	
KTM50S1	5.5	324	352	132	132	4-M10	4-M8	4-M12	-	-	-	
	7.5	324	352	132	132	4-M10	4-M8	4-M12	-	-	-	
KTM50S2 KTM50S3	7.5	324	352	132	132	4-M10	4-M8	4-M12	-	-	-	
	11	368	404	160	132	4-M12	4-M8	4-M12	-	-	-	
	15	368	404	160	132	4-M12	4-M8	4-M12	-	-	-	
KTM65S2	15	462	512	160	180	4-M12	4-M8	4-M12	285	210	2-M12	
	18.5	462	512	180	180	4-M12	4-M8	4-M12	285	210	2-M12	
KTM80S	22	462	512	180	180	4-M12	4-M8	4-M12	300	270	2-M12	
	30	356	430	180	180	4-M12	4-M8	4-M12	300	270	2-M12	

Accessories (Included in every package)

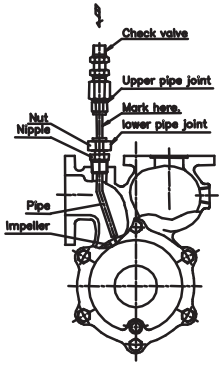
How to connect the nozzle to Air Flow Meter (Air In-Take Nozzle will be attached to every pump)



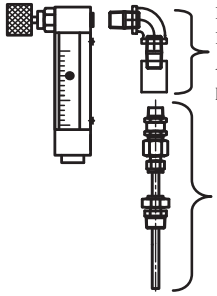
Applicalbe Model (Standard)	Dia. (E)	Length (L1)	Length (L2)	Length (L)	Dia. (D)
KTM15 (F)(N)(D)	R 3/8^{B}	121	36	157	R 1/4^{B}
KTM20 (F)(N)(D)	R 3/8^{B}	121	41	162	R 1/4^{B}
KTM25 (F)(N)(D)	R 3/8^{B}	121	46	167	R 1/4^{B}
KTM32 (F)(N)(D)	R 3/8^{B}	121	51	172	R 1/4^{B}
KTM40 (F)(N)(D)	R 3/8^{B}	121	56	177	R 1/4^{B}
KTM50 (F)(S)1,2,3	R 3/8^{B}	129	139	268	R 1/4^{B}

Applicable Model (Large-scaled Type)	Dia. (E)	Length (L1)	Length (L2)	Length (L)	Dia. (D)
KTM65S2 / F2	Rc 3/8	183	121	304	Rc 3/8
KTM80S / F	Rc 3/8	193	126	319	Rc 3/8

* In case of KTM80S / F model, connect “E” part with Bushing (3/4 x 3/8)



1) Ready for nozzle Head-impeller span adjust,
   loosen Lower Joint Nut to allow Nipple move freely.
2) Put mark showing Head direction as shown in the left illustration.
3) Apply sealing tape onto the Nipple of Lower Joint.
4) Insert Head Element into KTM connection opening and tighten Nipple.
5) Direct Head to the center of Impeller by turning Element with refer to the mark
6) Tighten Lower Joint Nut and ensure Nozzle assembly is firmly fixed.
7) check to see that Nozzle Head cannot touch with Impeller by turning the
   motor with a screw-driver at its axis end.



Noted :
Fitting connections &
Air Flow meter should be
prepared by purchaser

Air In-Tkae Nozzle will be
attached with every pump

Recommended Accessories (To be prepared by Purchaser)

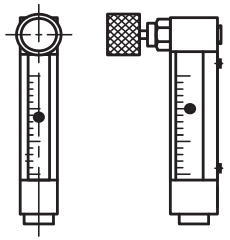
50Hz Frequency

Applicalbe Model (Standard)	Water Flow Rate m^3/Hr x 4Bar	Operation Air flow rate (N･L/min)	Air Flow Meter Range (N･L/min)
KTM20 (F)(N)(D)	1.0	1.3	0 to 5
KTM25 (F)(N)(D)	1.5	2.0	0 to 5
KTM32 (F)(N)(D)	3.0	4.0	0 to 10
KTM40 (F)(N)(D)	4.8	6.4	0 to 20
KTM50S1 / F1	8.0	10.6	0 to 20
KTM50S2 / F2	12.0	16.0	0 to 20
KTM50S3 / F3	15.0	20.0	0 to 30
KTM65S2 / F2	20.0	26.6	0 to 40
KTM80S / F	42.0	56.0	0 to 80

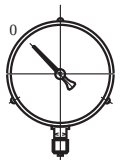
60Hz Frequency

Water Flow Rate m^3/Hr x 4Bar	Operation Air flow rate (N･L/min)	Air Flow Meter Range (N･L/min)
1.3	1.7	0 to 5
2.5	3.3	0 to 5
4.0	5.3	0 to 10
7.0	9.3	0 to 20
11.5	15.0	0 to 30
15.0	20.0	0 to 40
18.0	24.0	0 to 40
28.0	38.0	0 to 60
58.0	78.0	0 to 100

Air Parameter



Guages

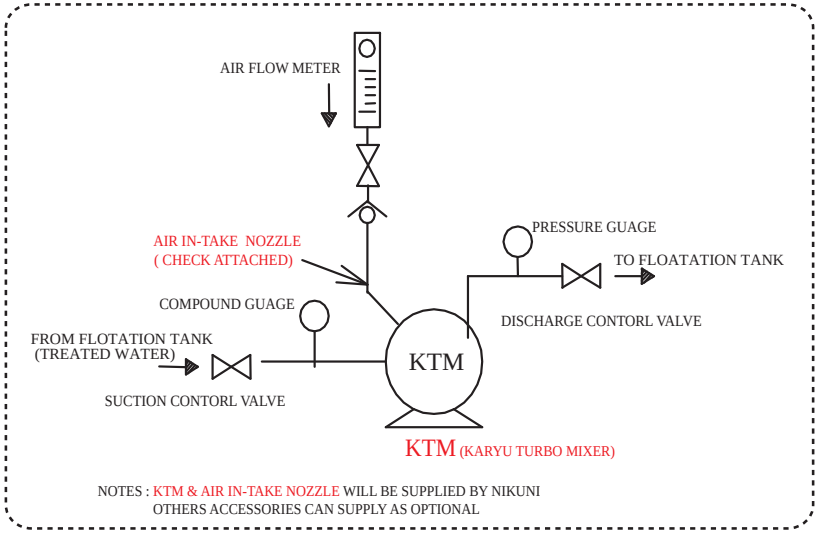


Compound Guage
Minus 0.1 MPa to + 0.25MPa
Minus 1.0 Bar to + 2.5 Bar
Minus 15psi to + 35 psi

Pressure Guage
0 MPa to + 1.0MPa
0 Bar to + 10 Bar
0 psi to + 150 psi

KTM Initial Running Procedure (Reference)

KTM Series pump user manual must be fully read and understood before operating the pump. Failure to do so may result in death, serious injury, or property damages. This page is intended for a basic understanding of KTM startup operation and not a substitute for the user manual.



PRE-OPERATION CHECK (POWER IS OFF)

1) Prime **KTM** with effluent or water
2) Fully open **Suction valve** and **Discharge valve**
   *Do not run **KTM** with these valves closed

STARTING KTM

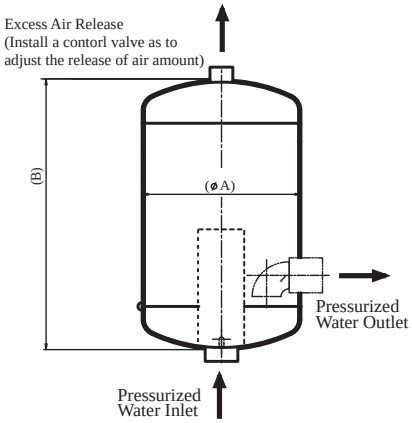
1) Discharge side adjustments:
   Slowly tighten the **Discharge valve** until the discharge pressure falls within the desired range of 0.3MPa to 0.4MPa (approximately 3bar to 4bar) with reference to the Pressure gauge.

   In the case where the **Discharge valve** (or **KTM**) is located far from the flotation tank, bubbles will then grow larger. In order to maintain micro bubble size, an additional control valve should be installed on the flotation tank side to control the discharge pressure.

2) Suction side adjustments:
   Check to see if the **Compound gauge** indicates a negative suction pressure between the range of -0.02MPa to -0.03MPa (approximately -0.2bar to -0.3bar). If the pressure is higher than this range, slightly tighten the **Suction valve** to bring the pressure into the range stated above.

3) Air injection adjustments:
   Open the knob of **Air-Parameter** (Air flow meter) and adjust to an air flow rate that is 8% of the water flow rate.

In case of mini bubbles occur and effect to flotation process, please consider installing Excess Air Device / Separation Tank as shown on the right.



Model	A (mm)	B (mm)	Capacity (Liter)
KTM20N(F)(D)	100	260	2
KTM25N(F)(D)	120	350	4
KTM32N(F)(D)	260	400	20
KTM40N(F)(D)	260	400	20
KTM50S(F)1,S(F)2,S(F)3	300	850	60
KTM65S(F)2	450	900	140
KTM80S(F)	450	900	140

Note : Strength and reinforcement structure of "Excess Air Device / Separation Tank" should be considered against KTM discharge pressure.

KTM installation method (Reference)